THE PREVALENCE OF HEPATITIS B IN CHILDBEARING SOUTHEAST ASIAN REFUGEES IN THE SALT LAKE AREA

by

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A thesis submitted to the faculty of
The University of Utah
in partial fulfillment of the requirements for the degree of

Master of Science

College of Nursing

University of Utah

June 1985

THE UNIVERSITY OF UTAH GRADUATE SCHOOL

SUPERVISORY COMMITTEE APPROVAL

of a thesis submitted by

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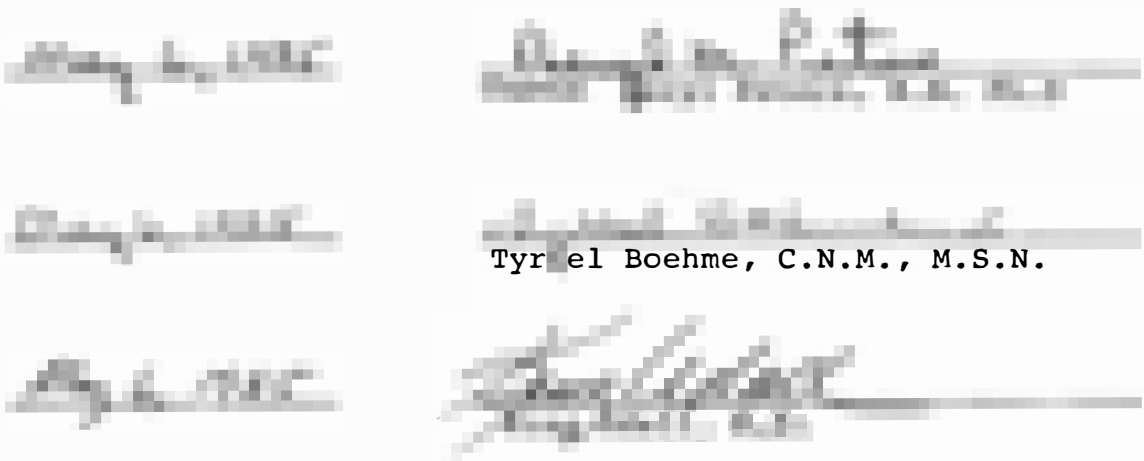

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I have read the thesis of Sandae Bonare in its final form and have found that (1) its format, citations, and bibliographic style are consistent and acceptable; (2) its illustrative materials including figures, tables, and charts are in place; and (3) the final manuscript is satisfactory to the Supervisory Committee and is ready for submission to the Graduate School.

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ABSTRACT

Over 7,000 Southeast Asian refugees live in the Salt Lake area. The hepatitis B carrier rate among Southeast Asians in the United States is 12-14%. A retrospective study was conducted to obtain data concerning the prevalence of hepatitis B virus among Southeast Asian prenatal clients. The study sample consisted of 129 charts reviewed from two Salt Lake area clinics. The time period included all the Southeast Asian women receiving prenatal care who delivered in 1984 and those delivered or undelivered who had prenatal blood drawn prior to February 28, 1985.

Demographic data revealed the sample to be between the ages of 15 and 44 years. Ninety-six percent were married and 60% were Cambodian.

Of the 129 charts reviewed, 75 (58%) were screened for hepatitis B surface antigen (HBsAg). There was no significant difference by clinic in the percentage of subjects tested.

Among the 75 subjects screened for HBsAg, 7 were HBsAg positive. The prevalance of HBsAg among Southeast Asians screened in this study was 9.3%.

Inconsistent management of the HBsAg positive subjects and their infants has been noted.

The findings of this study suggest that an inadequate number of Southeast Asians are being screened for hepatitis, and that further research in this area is warranted.

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ACKNOWLEDGMENTS

I would like to acknowledge those individuals who made contributions towards the completion of this thesis. Appreciation is extended to my committee members, Beryl Peters, King Udall and Tyrrel Boehme. A special thanks to Tyrrel for her interest, guidance, humor and time during the preparation of this study. Gratitude is also extended to John Sullivan for his willingness to share his time and his knowledge of computers.

I wish to offer my appreciation to my parents for encouraging my education. Special love and gratitude are expressed to Dennis Conroy, Lyell Fox and Karen Kuehn for their understanding, encouragement, friendship and patience during the completion of this project.

CHAPTER I

INTRODUCTION AND REVIEW OF LITERATURE

Since the fall of the Republic of South Vietnam in 1975, over 600,000 Southeast Asian refugees have emigrated to the United States. Recent figures from the Utah Vital Statistics Department indicate that over 7,000 refugees are in Utah. Approximately 90% of the refugees are under 40 years of age and 40% are female. Of the female population, approximately 80% are of childbearing age (Barry, Craft, Coleman, Coulter & Horwitz, 1983; Larsen, 1982). They are comprised of several subgroups: Vietnamese, ethnic Chinese/-Vietnamese, Laotian, Hmongs, Cambodians or Khmers, ethnic Chinese/Cambodians, Black Thais, and Nungs, including variations within some of these groups (Catazaro & Mozer, 1982; Center for Disease Control [CDC] 1975, 1984). While acknowledging the fact that each group is distinguished by unique cultural and health practices, because specific cultural information is often not available on prenatal charts, the term Southeast Asian (SEA) is used to encompass all subgroups.

The health problems of the Southeast Asians include tuberculosis, parasitism, hepatitis A and B and malaria. These diseases have been well documented and reflect illnesses indigenous to Southeast Asia (CDC, 19791a, 1979b, 1979c, 1979d, 1979e, 1979f). Larsen, the Refugee Health Coordinator for the Utah State Health and Pulmonary Programs, has accumulated the following morbidity percentages for the Utah refugees: 53% have positive tuberculin skin tests; 56% have at least one or more parasites; 75% need dental care; and 12-21% are hepatitis B carriers. These figures are representative of Salt Lake City because over 75-80% of the total Utah refugees settled in the Salt Lake area (Larsen, 1982). Of all the health problems encountered in this population, hepatitis B and tuberculosis create the greatest public health concern.

Southeast Asian refugees are routinely screened for tuberculosis and receive appropriate care and followup from public health agencies. Unfortunately, screening for hepatitis B is not routine, and the disease is often missed. Hepatitis B is infectious in both the acute and the carrier state. Carriers are usually healthy and show no signs of illness to warrant testing. A mother who is an infectious carrier has nearly a 100% chance of infecting her newborn. The Hepatitis B carrier who acquires the disease peri-

natally is at risk for cirrhosis of the liver and primary hepatocellular carcinoma, both of which may be fatal. In addition to the newborn, health care providers are at particular risk.

History of Hepatitis

Acute viral hepatitis is a systemic infection primarily affecting the liver. Diseases of the liver, particularly jaundice, are described and found in the Babylonian Talmud, 5th century B.C. (McCallum & Bradley, 1944; Zukerman, 1975). Hippocrates described epidemic jaundice, the disease that is recognized today as hepatitis as "infectious icterus" (Krugman, 1978), and as the "fourth kind of jaundice" (Zukerman, 1975). Frequent occurrences of the disease were reported during the seventeenth and eighteenth centuries among diverse populations and geographical areas. It was suspected that poor sanitation and large populations resulted in fecal contamination of food and water, which lead to viral hepatitis.

The first identified (retrospectively) outbreak of hepatitis B was reported by Lurman in 1885. He described "an epidemic of icterus" among shipyard workers who had been inoculated with smallpox vaccine made up of human serum (Lurman, 1885). It is probable that the donor was a carrier of hepatitis B virus. During the

first half of this century, additional outbreaks of "long incubation period hepatitis" occurred in various countries of the world. Many fatalities and illnesses during that time were unrecognized iatrogenic cases of serum hepatitis B virus (HBV). The outbreaks were caused by the use of hepatitis B contaminated needles, syringes, blood, and blood products (Findlay & MacCallum, 1937; Sawyer, Meyer, Eaton, Bauer, Putman & Schwentker, 1944; Krugman, 1978).

Hepatitis B research was complicated by the inability to find susceptible experimental animals. Human volunteer trials in the 1940s provided the only reliable method to study the disease (Krugman, 1978). The studies by Voegt (1942), McCallum and Bradley (1944), Havens, Ward, Drill and Paul (1944) and Paul, Havens, Sabin and Phillip (1945) demonstrated that hepatitis was caused by at least two viruses, subsequently named hepatitis A virus (HAV) and hepatitis B virus (HBV). The viruses were not actually seen but distinct epidemiological and immunological differences were noticed (Zukerman, 1975). Two important differences observed were the route of infection and the incubation period. The terms hepatitis A for infectious or epidemic hepatitis, and hepatitis B for serum hepatitis or homologous serum jaundice were introduced by McCallum in 1947. These terms were generally adopt-

ed in 1973 by the Scientific Group on Viral Hepatitis of the World Health Organization and by the Expert Committee on Viral Hepatitis in 1977 (Zukerman, 1975).

Hepatitis B Virus

Hepatitis B is caused by the hepatitis B virus (HBV), referred to as the Danes particle (Dienstag, Wands & Koff, 1983), and is usually found only in the liver cells (Cohen & Cohen, 1983). Replication of the virus occurs in the hepatocytes (Cohen & Cohen, 1983; Hoofnagle, 1981). Although HBV is usually confined to the liver, in some cases it can be found in serum (Dienhardt, 1980). The HBV can be identified directly by electron microscopy or indirectly through immunological assays of its various antigens and antibodies. Since electron microscopy is expensive and tedious, the immunological assay is the method of choice (Cohen & Cohen, 1983).

The virus is composed of an outer protein surface coat and a central core (Cohen & Cohen, 1983; Deinstag et al., 1983). The core contains the DNA genome, hepatitis B core antigen (HBcAg), and proteins necessary for its replication (Cohen & Cohen, 1983; Deinstag et al., 1983; Hoofnagle, 1981). Several of the viral proteins are antigenic, stimulating the immune system to form antibodies (Hoofnagle, 1981). There are three

antigen-antibody systems associated with hepatitis B virus (HBV): hepatitis B surface antigen (HbsAg) and its antibody (anti-HBs); hepatitis B core antigen (HBcAg) and its antibody (anti-HBc); and hepatitis B "e" antigen (HbeAg) and its antibody (anti-HBe). When an individual is infected with HBV, the rise and fall of these antigens and their corresponding antibodies are evaluated serologically to assess the disease process.

HBsAg, formerly called the "Australia antigen," can be identified in serum 30-60 days after exposure to HBV and persists for variable periods (Hoofnagle, 1981; CDC, 1981b). This surface coat protein is produced in extraordinary quantities as noninfectious material during HBV replication (Lutwick, 1984). The measurement of HBsAg determines the presence of HBV. It is believed that the liver parenchymal cell is the sole site of virus production (Lutwick, 1984), although the pancreas has also been implicated as another site for viral replication (Shimoda, Shikata & Karasawa, 1981).

HBsAg level will usually decline prior to the cessation of clinical symptoms or during early convalescence (CDC, 1981a; Cohen & Cohen, 1983); although some individuals will remain HBsAg (positive) for life, resulting in a chronic HBV carrier state (CDC, 1981a).

The absence of HBsAg does not guarantee the absence of disease. There is often a gap or "window phase" between the clearance HBsAg and the appearance of antibodies to HBs (CDC, 1981a; Deinstag et al., 1983; Hoofnagle, 1981). The hepatitis B "e" antigen (HBeAg) correlates with the degree of infectivity of the serum. HBeAg appears early in the acute phase and usually disappears before HBsAg is gone (Cohen & Cohen, 1983; CDC, 1981b; Dienhardt, 1980). It indicates that the individual is highly infectious and is often seen early in the course of the illness (Cohen & Cohen, 1983).

Anti-HBc is the most reliable serologic marker of hepatitis B virus infection (Hoofnagle, 1981). It is present in the serum at the onset of clinical symptoms (CDC, 1981a; Deinhardt, 1980) and remains high as long as HBV viral replication continues (CDC, 1981a; Hoofnagle, 1981). HBsAg is the serologic marker most frequently used as it is the least expensive, and identifies those who are in the acute phase or who are long-term carriers.

When screening Southeast Asians, HBsAg is usually sufficient since most Southeast Asians are long-term carriers. In cases where the HBsAg is positive, the blood should be tested for other HBV antigens and antibodies to determine the infectiousness and the stage of the illness. If there is a questionable

history of hepatitis or hepatitis symptoms or the possibility of a "window phase" anti-HBc should be evaluated (Hoofnagle, 1981).

The CDC recommends that women with the following risk factors should have prenatal serologic screening (CDC, 1981a):

1. Asian descent or birth in an endemic area.
2. Acute or chronic liver disease.
3. Rejection as a blood donor.
4. Work or treatment in a dialysis unit.
5. Working or living in an institution for the retarded.
6. Percutaneous drug abuse.
7. Household members with hepatitis B.
8. Prostitution.
9. Occupational exposure to blood.

Transmission of Hepatitis B Virus

The transmission of hepatitis B virus has long been studied. The original designation of "serum hepatitis" is no longer an adequate label due to the varied modes of transmission recognized today. It is true that the major route of infection remains percutaneous (exposure to blood products through needle punctures and transfusions), but many indirect routes are also recognized. Due to minute breaks in tissue and mixing

of blood, HBsAg has been recovered in a variety of body fluids -- saliva, tears, seminal fluid, cerebrospinal fluid, breast milk, etc. (CDC, 1981a; CDC, 1981b; Deinstag et al., 1983; Dzik & Alter, 1982; Lee, Ip & Wong, 1978). HBV has been shown to be transmitted by sexual contact, perinatal exposure and perhaps by insects (Beasley, Hwang & Cladd, 1983a; Chaudhary, 1983; Chin, 1983; Koff, Slavin & Connelly, 1977; Newkirk, Downe & Simon, 1975).

Perinatal transmission appears to be the most important means of spreading HBV worldwide. In endemic areas, 80-90% of HBV infections appear to be spread by maternal to fetal transmission at the time of labor and delivery (Dzik & Alter, 1982; Okada, Kamiyama & Inomata, 1976). Studies in Taiwan show that there is a 40% rate of chronic carriers being perinatally infected (Beasley, 1982; Beasley et al., 1983). In view of this, asymptomatic hepatitis B carrier mothers serve as the primary reservoir for the HBV (Beasley, Lee & Hwang, 1983; Tada, 1982). Of those HBV carriers who are HBsAg(+), approximately 30-44% are also HBeAg(+) (Dzik & Alter, 1982; Stevens, 1982).

Since HBeAg is usually found in association with the whole virus, a neonate whose mother is an HBV carrier HBeAg(+) has an 80-100% chance of contracting

the disease (Beasley & Trepo, 1977; Deinstag et al., 1983; Lutwick, 1984; Okada et al., 1976). Once infected the newborn has an 80-90% risk of becoming a chronic HBsAg carrier as opposed to 6-10% risk if infected as an adult (Beasley, 1982; CDC, 1982; Stevens, 1982). Considering these statistics and the 12-14% HBV carrier rate in American Southeast Asian refugees, approximately 4 out of every 100 of their newborns are at risk of becoming chronic carriers. In addition, there appears to be an inverse relationship between the age HBV infection is acquired and the development of liver cirrhosis and primary hepatocellular carcinoma (Beasley, 1982; CDC, 1982). Thus, the individual who acquires HBV infection through maternal transmission has a greater chance of developing cirrhosis and liver cancer than an individual who acquires HBV infection as an adult. In an elaborate study of 22,707 Taiwanese men, Beasley et al. (1981) revealed that those with HBsAg had an incidence of primary hepatocellular carcinoma 233 times higher than noncarriers.

The literature shows that perinatal transmission most likely occurs at or near the time of birth rather than in utero or during the postnatal period (Beasley et al., 1983b; Dzik & Alter, 1982; Goudeau, 1983; Wong, Lee & Henrietta, 1980). This is evident from the following factors. First, for some infants who become

HBsAg positive, cord blood is HBsAg negative at birth (Beasley et al., 1983a). Beasley et al. (1983b) also demonstrated that 58 out of 61 infants of carrier mothers (95.1%) who did not receive hepatitis B immune globulin (HBIG) at birth were HBsAg(+) at 3 months of age (Beasley et al., 1983a; Beasley et al., 1983b).

The clinical incubation period of HBV ranges from 60 to 180 days with an approximate mean of 100 days (Krugman, Overby & Mushahawar, 1979). Infants remaining HBsAg(+) at 3 months after receiving HBIG at birth were most likely infected in utero (Beasley et al., 1983a; Tada, 1982). Approximately 5-10% of infants are infected prior to birth (Beasley et al., 1983a; Chin, 1983; Tada, 1982; Wong et al., 1980). This is probably due to maternal fetal transfusions as a result of bleeds or "leaks" across the placenta (Beasley & Trepo, 1977; Beasley et al., 1983; Beasley, Stevens, Shiao & Meng, 1975).

During the perinatal period, there are several modes of hepatitis transmission. HBsAg has been isolated in maternal vaginal secretions, amniotic fluid, saliva, breast milk and blood (Dienstag et al., 1983; Lee et al., 1978; Wong et al., 1980). In the newborn, HBsAg has been found in cord blood, peripheral blood,

and in gastric and nasal fluids (CDC, 1981a; Lee et al., 1978). Other portals of entry into the newborn blood stream besides maternal fetal transfusion and utero-placental leaks, include lesions resulting from scalp electrodes, fetal pH sampling and through abrasions caused by vigorous intubation and forceps (Chaudhary, 1983; Dienstag et al., 1983; Wong et al., 1980).

Health care providers are also at risk when caring for the HBsAg individual during the perinatal period (CDC, 1981a; Werner & Grady, 1982). Precautions must be taken to prevent contamination with blood and body fluids. The risk of the health care provider becoming infected and developing a carrier state is small (Dzik & Alter, 1982), but due to the implications of the carrier state to the professional, care must be advised (CDC, 1982; Denes & Smith, 1978).

Epidemiology

The prevalence of hepatitis B varies from country to country and is conditional on a variety of social, environmental, behavioral and host factors. It has been estimated that there are at least 176,000,000 chronic carriers of HBsAg worldwide (Sobeslavsky, 1978). In northern, central and western Europe, North America and Australia (populations of British ancestry) HBsAg is detected in 1% or fewer members of the popula-

tion, whereas the rates in southern and eastern Europe, the USSR, Central and South America, Africa, Asia, Oceania, South and West Pacific range from 2% to greater than 10% (Sobeslavsky, 1978; Szmuness, 1975; Szmuness, Harley & Ikram, 1978).

The Asian continent has been found to have a high prevalence of HBV and in some areas may be as high as 40% (Sobeslavsky, 1978; WHO, 1977). Refugees from Southeast Asia residing in the United States have been found to have a prevalence rate of HBsAg of 12-14% (Barry et al., 1983; CDC, 1981a; Lutwick, 1984).

The prevalence of HBsAg has also been studied in relation to age. In a highly endemic area, such as Asia, the highest rates occur in the pediatric population, often in the 0 to 4 year old age group (Sobeslavsky, 1978). This is a direct result of perinatal transmission.

Other variables, many of which are interconnected, include lower socioeconomic status, lower level of education, history of parenteral drug abuse, dialysis, institutionalization (especially those with Down's syndrome), health care providers, and male homosexuals (Szmuness et al., 1978). There is an increased risk of the carrier state that occurs in hemodialysis patients, institutionalized Down's patients, and in infants born of chronic carrier mothers (Szmuness et al., 1978).

Reports that the Southeast Asian refugees have a high HBsAg carrier rate have raised many questions in the medical community. Many of the questions concern the issues of serologic testing and the care of pregnant women and neonates. The development of effective vaccines makes it important to recognize antepartum carriers of HBV, so that during the intrapartum period the infants can be identified and given prophylaxis so as not to become chronic carriers. It is also necessary for health care providers to be aware of the HBV carriers, so they can take appropriate precautions to prevent transmission.

The purpose of the present research was to determine the prevalence of hepatitis B virus among childbearing Southeast Asian women in the Salt Lake area.

CHAPTER II

METHODOLOGY

A retrospective archival method was utilized in reviewing prenatal medical records from two Salt Lake County prenatal clinics for the following reasons:

1. Given time limitations, it provided for a relatively large population from which to investigate the prevalence of hepatitis B among the Southeast Asian childbearing population.

2. Both clinics are known in the community for service to and interest in the Southeast Asian population.

3. The accuracy of prenatal charting, documentation, and requisition of hepatitis B blood tests could be assessed.

For the purpose of this study:

1. Southeast Asian refugees were defined as those who immigrated to the United States from Vietnam, Thailand, Laos and Cambodia.

2. The sample was limited to Southeast Asian women who delivered in 1984, and those who delivered in 1985, or had prenatal blood tests drawn prior to February 28, 1985.

3. All Southeast Asian women who received prenatal care within the above time period were included in the study.

4. Hepatitis B surface antigen was the serologic marker used to identify those subjects who were in the acute phase or were carriers of hepatitis B virus.

5. Hospital medical records were reviewed for HBsAg positive subjects when available for pregnancy outcomes and management.

Permission was obtained from appropriate authorities at each clinic and hospital to acquire chart data pertaining to study of hepatitis B virus in childbearing Southeast Asians. A code sheet was developed to record all pertinent data (see Appendix). All information was coded to protect the anonymity of the individuals. Subjects were identified by coded numbers and medical record numbers and were not identified by name.

CHAPTER III

RESULTS AND DISCUSSION

The investigation was conducted to obtain data concerning the prevalence of hepatitis B virus among Southeast Asian prenatal clients. The sample consisted of 129 charts retrospectively reviewed from two Salt Lake City prenatal clinics. The time period included all the Southeast Asian women receiving prenatal care who delivered in 1984 and 1985, and also included those who had not delivered but who had prenatal blood work prior to February 28, 1985.

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) for frequencies, general descriptive statistics, and the Fisher's Exact Probability Test. These statistics were calculated by the Univac 1100 computer at the University of Utah Computer Center. Percentages and differences between percentages were computed by hand calculator. Confidence levels were established at the .05 level.

Demographic Data

The demographic data available in the charts consisted of age, marital status, gravida, parity, and

ethnicity. Table 1 represents a demographic profile of the subjects. Ages ranged from 15 years to 44 years, with a mean age of 26 years (S.D.=6.6). Ninety-six percent of this population are married with the remaining 4% single. The number of pregnancies per woman ranged from 1 to 10, with a mean of 3.5 (S.D.=2.3). It is of interest that the majority was Cambodian (60%). In most studies on the health status of Southeast Asian refugees, Vietnamese clients make up the largest group (Catanzaro & Moser, 1982; Barry et al., 1983).

Screening for HBsAg

Table 2 summarizes the number of subjects tested and not tested for HBsAg at the two clinic sites. Of the 129 charts reviewed, 75 (58%) were screened for HBsAg. There was no significant difference by clinic, in the percentage of subjects tested.

Of the 75 subjects screened for HBsAg, 7 were HBsAg positive. The prevalence of HBsAg among Southeast Asians in the sample who were screened was 9.3% (see Table 3). As stated previously, Southeast Asian refugees residing in the United States have been found to have HBsAg prevalence rates of 12-14% (Barry et al., 1983; CDC 1981a; Lutwick, 1984). The prevalence of HBsAg in this sample was somewhat below that reported in the literature. Due to the small sample size, the

TABLE 1

Demographic Profile of Sample Population

# (%):	Vietnamese 11 (09%)	Laotian 30 (24%)	Cambodian 75 (60%)	Hmong 9 (7%)
Age:				
15-20	0 (0%)	8 (27%)	75 (60%)	9 (7%)
21-30	8 (73%)	18 (60%)	45 (60%)	4 (44%)
31-40	3 (27%)	3 (10%)	13 (17%)	0 (0%)
> 40	0 (0%)	1 (3%)	6 (8%)	0 (0%)
Marital Status:				
M.	11 (100%)	29 (97%)	71 (95%)	9 (100%)
S.	0 (0%)	1 (3%)	4 (5%)	0 (0%)
Gravida (mean):	3.8 (s.d.=2.4)	2.6 (s.d.=1.5)	3.8 (s.d.=2.5)	3.7 (s.d.=2.9)
Clinic Site:				
#1	2 (18%)	14 (47%)	5 (07%)	1 (11%)
#2	9 (82%)	16 (53%)	70 (93%)	8 (89%)

This table represents 97% of the sample population.
3% did not have an ethnic differentiation.

TABLE 2

Comparison of Testing for HBsAg
in Two Clinic Sites

	Site	Test (%)	Not Tested (%)	Total # of Subjects (%)
Clinic	1	14 (56)	11 (44)	25 (19)
Clinic	2	61 (59)	43 (41)	104 (81)
TOTALS		75 (58)	54 (42)	129 (100)

HBsAg - hepatitis B surface antigen

TABLE 3

Comparison of HBsAg Positive Results and
HBsAg Negative Results
at each Clinic Site

Site	HBsAg Positive (%)	HBsAg Negative (%)	Total # of Subjects (%)
Clinic 1	1 (7)	13 (93)	14 (19)
Clinic 2	6 (10)	55 (90)	61 (81)
TOTALS	7 (9.3)	68 (90.7)	75 (100)

HBsAg - hepatitis B surface antigen

researcher cannot be confident of the external validity.

By rough inspection, it appeared that the Cambodian population had a higher prevalence for positive HBsAg than the other nationalities tested (see Table 4). Using the Fisher's Exact Probability Test, no significant difference between nationality and prevalence could be determined.

Comparison of HBsAg Positive Subjects

Of the 7 positive HBsAg subjects identified, 2 have not delivered yet, 1 transferred out of the area prior to delivery, and 4 delivered at a major Salt Lake area hospital.

Four out of the seven charts had instructions to alert pediatricians at the delivery to provide prophylaxis for the newborns. There was no consensus of how to manage the HBsAg positive pregnant women (see Table 5). Four subjects received no followup blood tests after being found HBsAg positive in the prenatal period. Two were tested for HBs antibodies and found to be negative. One was tested for HBeAg, and one subject had liver function tests.

Infants of HBsAg Positive Mothers

Infants born to HBsAg positive mothers were subject to a variety of procedures (see Table 6). Two

TABLE 4

Comparison of Negative and Positive
HBsAg Tests by Nationality

	HBsAg Negative(%)	HBsAg Positive (%)	Total # Tested (%)
Vietnamese	4 (8)	1 (2)	5 (6.7)
Laotian	14 (93)	1 (7)	15 (20.0)
Cambodian	45 (90)	5 (10)	50 (66.6)
Hmong	3 (100)	0 (0)	3 (4.0)
Unknown	2 (100)	0 (0)	2 (2.7)
TOTALS	68 (91)	7 (9)	75 (100.0)

TABLE 5

Further Testing of HBsAg Positive Subjects

	HBeAg	Anti-HBc	Tests That Were Done
1	NT	NT	None
2	NT	NT	Anti-HBs, LFT
3	TESTED	NT	Anti-HBs, HBeAG
4	NT	NT	None
5	NT	NT	None
6	NT	NT	Scheduled for HBeAg and Repeat HBsAg at term
7	NT	NT	None

Anti-HBs - hepatitis B surface antibody
HBeAg - hepatitis B "e" antigen
Anti-HBC - hepatitis B core antibody
LFT - liver function tests
NT - not tested

infants were not given prophylaxis for hepatitis and two received the hepatitis B immunoglobulins (HBIG) in addition to the hepatitis B vaccine. The hepatitis B vaccine, when used in conjunction with the hepatitis B immunoglobulin (HBIG), has been found to be 94% effective in preventing the carrier state in the newborn (Beasley et al. 1983a).

The two infants who received prophylaxis were also scheduled for further vaccinations. One infant was scheduled at 1 and 6 months intervals, and the other was scheduled at 2 and 4 month intervals. The Center for Disease control Immunization Practices Advisory Committee recommends that the HBIG and hepatitis B vaccine be given at delivery and hepatitis B boosters given at 1 and 6 month intervals (CDC, 1984).

All infants were monitored during labor with internal fetal scalp electrodes. The electrodes are attached with a small wire to the infant's head while in the birth canal. Fetal scalp electrodes cause a break in the skin, thus further exposing the infant to the hepatitis B virus. The use of forceps for delivery may also cause breaks in the skin.

TABLE 6

Type of Delivery, Interventions and Vaccinations
of Infants of HBsAg Positive Subjects

	Type of Delivery	Use of FSE or Scalp pH	HbIg Given	HEPATOVAX Given	Repeat Vaccinations Scheduled
1	NSVD	FSE	NO	NO	None
2	NSVD	FSE	YES	YES	2 and 4 months
3	FORCEP	SCALP pH FSE	YES	NO	1 and 6 months
4	NSVD	SCALP pH	NO	NO	None

NSVD - Normal Spontaneous Vaginal Delivery
FSE - Fetal Scalp Electrode

CHAPTER IV

SUMMARY AND RECOMMENDATIONS

Summary

The aim of this study was to determine the prevalence of hepatitis B in the Southeast Asian childbearing population.

The researcher utilized the medical records of 129 Southeast Asian women who received prenatal care at two Salt Lake area clinics. Hospital medical records were also reviewed for four select cases. The subjects delivered in 1984/1985 and those undelivered had prenatal blood work prior to February 28, 1985. Computer analysis of the data included frequencies, descriptive statistics, and Fisher's Exact Probability Test.

The literature review revealed that prenatal transmission of the hepatitis B virus is a major means of spreading the infection. The general U.S. population carrier rate of 0.1 to 0.5% is quite low compared to the 12-14% carrier rate among the Southeast Asian population. Of vital importance is that hepatitis B may lead to fatal hepatitis in the newborn and cirrhosis of the liver and primary hepatocellular carcinoma

in the adult. Health care providers are also at great risk when caring for a hepatitis B infected individual.

The results of this study produced demographic data for the prenatal Southeast Asian population in two clinics in the Salt Lake area. The sample consisted of 60% Cambodian, 24% Laotian, 9% Vietnamese, and 7% Hmong. There were no major differences noted between the subgroups. Because it was believed that all Southeast Asians were being screened for hepatitis B, the original purpose of this study was to determine the prevalence of the disease. Out of 129 subjects, 75 (58%) were screened for HBsAg. Of the 75 Southeast Asians screened, 7 (9.3%) were HBsAg positive. This result was below the 12-14% rate cited in the literature. Undoubtedly, the size of the sample limits the generalizability of the findings to other samples, and caution must be used in interpreting the results. A major limitation of this research was the use of a retrospective design that did not allow for complete record keeping. The use of records that have not been kept for specific research needs are often incomplete and in some cases inaccurate.

In reviewing the prenatal charts and hospital records, a lack of consistency was seen in the management of HBsAg positive pregnant women and their infants.

Recommendations for Practice

Due to the large number of resettled Southeast Asians in the Salt Lake area, most obstetrical care providers will at one time be faced with the perplexity of prenatal hepatitis B. The first step for prevention is to identify the pregnant woman who is a potential HBV carrier. The Center for Disease Control recommends that women with the following risk factors should have serologic screening prenatally (CDC 1981a):

1. Asian descent or birth in an endemic area.
2. Acute or chronic liver disease.
3. Rejection as a blood donor.
4. Work or treatment in a dialysis unit.
5. Working or living in an institution with Down's patients.
6. Percutaneous drug abuse.
7. Household members with hepatitis B.
8. Prostitution.
9. Occupational exposure to blood.

A mother may be HBsAg positive due to an acute hepatitis B infection during pregnancy, or because she is a chronic carrier. The chronic carrier state is defined as being HBsAg positive at two times, at least 6 months apart (CDC, 1981b). It is important to test the HBsAg positive mother for HBeAg to determine the

stage and infectivity of the illness. This does not, however, alter the care of the newborn, since all HBsAg positive individuals are at risk of transmitting hepatitis B.

It is also recommended that in clinics where care is provided by many different staff members, the hepatitis screen be a routine part of the initial prenatal blood work. This may help to reduce the number of patients which are not being screened.

In the cases where the hepatitis screen is positive, care must be taken to minimize exposure of the infant to contaminated maternal body fluids. Judicious use of fetal scalp electrodes and operative deliveries is advised. Protocols for use of hepatitis B immunoglobulin and hepatitis B virus vaccine for newborns must be standardized and made available at delivery. The use of the public health system for follow up on the newborns may help with compliance.

Exposure to hepatitis B constitutes a serious occupational hazard to many health care workers. The provider who receives a puncture from a needle contaminated with blood containing hepatitus B virus has a 20% chance of becoming infected (CDC, 1981b). Health care providers must be made aware of the effect of hepatitis B. In clinics with a high risk population, the

hepatitis B vaccine should be made available to the health care providers.

Recommendations for Further Study

Based on the information derived from the findings the researcher offers several recommendations for further research of this nature.

1. The study should be repeated using a larger sample size with subjects from a greater variety of clinic sites.

2. Comparison research should be conducted at a later date to determine if a greater percentage of women are being screened for HBsAg.

3. It is necessary to learn if staff members are aware of the implications of HBsAg positive mothers and infants. Inservice education about hepatitis B might increase the screening rate of high risk clients.

APPENDIX: CODE SHEETS

Hepatitis B Code Sheet

Variable Number	Item	Code(s)	Number of Columns	Column Numbers
0	I.D. #	__ __ __	3	1-3
1	Clinic	1 = RWMC 2 = SLCC 3 = OTHER	2	4-5
2	Age	__ __	2	6-7
3	Gravida	__ __	2	8-9
4	Parity	__ = Term __ = Preterm __ = AB's __ = Living	4	10-13
5	Marital	1 = Married 2 = Single 3 = Divorced 4 = Other	2	14-15
6	Nationality	1 = Vietnamese 2 = Laotian 3 = Cambodian 4 = Hmong 5 = Other	2	16-17
7	Prev. Delivery (date)	__ __ Year	2	18-19
8		__ __ Month	2	20-21
9		__ __ Date	2	22-23
10	Cont. Use	1 = Yes 2 = No	2	24-25
11	Type Cont.	1 = BC Pills 2 = Barrier 3 = IUD 4 = Other	2	26-27
12	Place Prev. Delivery	1 = SLC 2 = Other U.S. Area 3 = Home Country 4 = Other	2	28-29
13	Tested for HBsAg	1 = Not tested 2 = Tested	2	30-31
14	HBsAg	1 = Positive 2 = Negative 3 = Not Tested	2	32-33

8 = Not available
9 = Missing data

Positive HBsAg Code Sheet

Variable Number	Item	Code(s)	Number of Columns	Column Numbers
15	HBeAg	1 = Positive 2 = Negative 3 = Not Tested	2	34-35
16	Anti-HBc	1 = Positive 2 = Negative 3 = Not tested	2	36-37
17	EDC (date)	__ __ Year	2	38-39
18		__ __ Month	2	40-41
19		__ __ Date	2	42-43
20	Date of Del.	__ __ Year	2	44-45
21		__ __ Month	2	46-47
22		__ __ Date	2	48-49
23	Type of Del.	1 = NSVD precip. 2 = NSVD Controlled 3 = Forcep/Vacuum 4 = C/S	2	50-51
24	Place of Del.	1 = Holy Cross 2 = Univ. of Utah 3 = Other SLC Hospital 4 = Other	2	52-53
25	HBiG (to newborn)	1 = Yes 2 = No	2	54-55
26	Followup 1-6 months scheduled	1 = Yes 2 = No	2	56-57

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